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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,056	05/20/2004	Ryosuke Inagaki	KY-202	6741

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MATTINGLY, STANGER & MALUR, P.C.
Suite 370
1800 Diagonal Road
Alexandria, VA 22314

EXAMINER	
SUTHERS, DOUGLAS JOHN	

ART UNIT	PAPER NUMBER
2614	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/849,056	INAGAKI, RYOSUKE	
	Examiner	Art Unit	
	Douglas J. Suthers	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4,5 and 9-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4,5 and 9-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

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DETAILED ACTION

The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2614.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-5 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 9 use the terms “BTL” and “IC” without expressly disclosing the meaning.

Claims 5 refers to “the switch circuit” which is unclear.

Claims 5 and 10-12 are rejected as being dependent on the above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heithoff (US 6346854 B1) in view of Shimotoyodome (US 7020293 B2).

Regarding claim 4, Heithoff discloses a mute circuit in a BTL circuit formed in an IC which drives a speaker (figure 2, item 114) by a first output stage amplifier (116) and a second output stage amplifier (124) which generates an inverted output signal with respect to an output signal of the first output stage amplifier, comprising:

a mute signal generation circuit (as described in column 4 lines 12-37) for generating the mute signal (CSD);

wherein the second output stage amplifier receives the output signal of the first output stage amplifier (117) as an input and generates the inverted output signal, the output signal of the first output stage amplifier is output to a terminal (VOUT-) of the speaker, and the output signal of the second output stage amplifier is output to another terminal (VOUT+) of the speaker and wherein each of the first and second output stage amplifiers is an operational amplifier.

Heithoff does not expressly disclose the claimed switching.

Shimotoyodome discloses an operational amplifier (figure 4) of which an output stage is constituted by a-push-pull structured transistors (34 and 35), one of two switch

circuits is provided between a gate of one the push-pull structured transistors and a power source line (33), and another of the two switch circuits is provided between a gate of another of the push-pull structured transistors and ground (32), the two switch circuits are provided for turning OFF the push-pull structured transistors of one of the output stage amplifier by a mute signal to effect muting and the output of the output stage amplifier is set at a high impedance (column 3 lines 26-50, column 4 lines 11-24).

Although Shimotoyodome does not expressly disclose the content of the mute signal, it would have been an obvious design choice it mute for a predetermined length of time. The motivation to do so would have been to allow for enough time for circuits to stabilize, yet not overly delaying operation. Therefore at the time of invention, it would have been obvious to one of ordinary skill in the art to further comprise a mute signal that mutes for a predetermined interval.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the switching of Shimotoyodome in the system of Heithoff. The motivation for doing so would have been cut off current to the speaker from the power amps in a more direct manner, insuring no sound is heard. Therefore, it would have been obvious to combine Shimotoyodome with Heithoff to obtain the invention as specified in claim 4.

Regarding claim 5, Heithoff discloses wherein the second output stage amplifier receives the output signal of the first output stage amplifier via a resistor (R12).

Shimotoyodome discloses wherein the switch circuit is an analog switch (32 and 33), the mute signal is generated when a power source is turned ON or OFF and the analog switch is turned ON during muting (column 4 lines 11-24).

Regarding claim 9, Heithoff discloses a BTL audio amplifier apparatus formed in an IC which drives a speaker (figure 2, item 114) by a first output stage amplifier (116) and a second output stage amplifier (124) which generates an inverted output signal with respect to an output signal of the first output stage amplifier, comprising:

a mute signal generation circuit (as described in column 4 lines 12-37) for generating the mute signal (CSD)

wherein the second output stage amplifier receives the output signal of the first output stage amplifier (117) as an input and generates the inverted output signal, the output signal of the first output stage amplifier is output to a terminal of the speaker (VOUT-), and the output signal of the second output stage amplifier is output to another terminal of the speaker (VOUT+), and through the mute signal the switch circuit is turned OFF for a predetermined interval to effect muting (column 4 lines 12-50) .

Heithoff does not expressly disclose the claimed switching.

Shimotoyodome discloses an operational amplifier (figure 4) of which an output stage is constituted by a-push-pull structured transistors (34 and 35), one of two switch circuits is provided between a gate of one the push-pull structured transistors and a power source line (33), and another of the two switch circuits is provided between a

gate of another of the push-pull structured transistors and ground (32), the two switch circuits are provided for turning OFF the push-pull structured transistors of one of the output stage amplifier by a mute signal to effect muting and the output of the output stage amplifier is set at a high impedance (column 3 lines 26-50, column 4 lines 11-24).

Although Shimotoyodome does not expressly disclose the content of the mute signal, it would have been an obvious design choice it mute for a predetermined length of time. The motivation to do so would have been to allow for enough time for circuits to stabilize, yet not overly delaying operation. Therefore at the time of invention, it would have been obvious to one of ordinary skill in the art to further comprise a mute signal that mutes for a predetermined interval.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the switching of Shimotoyodome in the system of Heithoff. The motivation for doing so would have been cut off current to the speaker from the power amps in a more direct manner, insuring no sound is heard. Therefore, it would have been obvious to combine Shimotoyodome with Heithoff to obtain the invention as specified in claim 9.

Regarding claim 10, Heithoff discloses wherein the second output stage amplifier receives the output signal of the first output stage amplifier via a resistor (126).

Shimotoyodome discloses wherein the first switch circuit is an analog switch (32 and 33), the mute signal is generated when a power source is turned ON or OFF and the analog switch is turned ON during muting (column 4 lines 11-24).

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heithoff (US 6346854 B1) in view of Shimotoyodome (US 7020293 B2) and Ishida (US 2002/0075072 A1).

Regarding claim 11, Shimotoyodome does not disclose plural drive circuits.

Ishida discloses further comprising a plurality of second switch circuits (figure 3, items 20a-20d) provided in any one of the first and second output stage amplifier, wherein the respective first and second output stage amplifier are provided with a plurality of drive circuits for driving the respective transistors, and through interrupting operation currents of the plurality of drive circuits upon receiving the mute signal by the plurality of the second switch circuits and through turning OFF the transistors, any one of the outputs of the first and second output stage amplifier is set at a high impedance (paragraph [0030]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the drive circuits of Ishida in the system of Heithoff and Shimotoyodome. The motivation for doing so would have been to further customize the singles to avoid situations such as shoo-though currents. Therefore, it would have been obvious to combine Ishida with Heithoff and Shimotoyodome to obtain the invention as specified in claim 11.

Regarding claim 12, Ishida discloses wherein the drive circuit is an amplifier circuit (20a-20d), the plurality of second switch circuits interrupt the operation currents of the plurality of the amplifiers in the second output stage amplifier.

Shimotoyodome discloses wherein the switching circuits turns OFF the transistors (column 3 lines 26-50, column 4 lines 11-24).

Although Ishida does not expressly disclose a differential amplifier, the use of such would have been an obvious design choice. The motivation to do so would have been to reuse previously engineered amplifiers such as operational amplifiers, thus reducing costs. Therefore at the time of invention, it would have been obvious to one of ordinary skill in the art to further comprise a differential amplifier.

Response to Arguments

Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas J. Suthers whose telephone number is (571)272-0563. The examiner can normally be reached on Monday-Friday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Douglas J Suthers/
Examiner, Art Unit 2614

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614